liquids. But since neither *b* nor *c*, as the author himself points out, can exercise any effect on turgor pressure, it is difficult to see why they should be reckoned as components. The study of the osmotic pressure of the solutes in cell sap and wall is carried out with a show of mathematical formulae that look formidable, but the data are really not yet adequate for exactness. The experimental results show that the observed osmotic pressure is always less than the calculated, which is due to the greater or less but general permeability of the protoplasts, a feature too much overlooked hitherto, though clearly pointed out by various investigators and *a priori* obvious. The effects of temperature changes, especially between 0° and 20° C., were also examined. A warning against conclusions based on the exclusive use of KNO_3 as a plasmolytic agent without correction for permeability is given.

In a later paper,[3] LEPESCHKIN reports the results of a study of the permeability of the pulvinus cells of Phaseolus and Mimosa, in which this proves to be surprisingly high. The solutes (except sugar) escape so rapidly when the tissues are brought into water, and especially into running water, as to reduce the apparent osmotic pressure (determined by the isotonic coefficient method) by 25 to 50 per cent. A change in the permeability of the plasma membranes may alter the turgor pressure by several atmospheres. LEPESCHKIN proposes to show in another article that such changes really occur (as has been hitherto assumed) under the action of various agents.—C. R. B.

The blood of plants.—PALLADIN'S preliminary paper[4] bears a rather striking title, which will be just enough if the theory proposed is fully established. Certain colorless chromogens, probably products of protein decomposition, have been found in plants, and these become pigments (already familiar to common observation in various discolorations produced on cutting or crushing) under the action of oxygen in the presence of oxidases. These respiratory enzymes are therefore to be considered as pigment producers, and the respiratory pigments doubtless include a number of pigments already known, such as those of the indigo plants. PALLADIN proposes to call all of them, irrespective of their chemical composition, phytohematins, in recognition of the identity of their physiological significance with that of the hematin of the blood. To show this it was necessary to find reductases in plant as in animal tissues, and PALLADIN announces their discovery. These enzymes reduce the respiratory pigments, which then go on down to CO_2, and H_2O, etc. The following scheme shows the relation of the various respiratory processes:

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3 LEPESCHKIN, W. W., Ueber die osmotischen Eigenschaften und den Turgordruck der Blattgelenkzellen der Leguminosen. Ber. Deutsch. Bot. Gesells. **26a**:231–238. 1908.

4 PALLADIN, W., Das Blut der Pflanzen. Ber. Deutsch. Bot. Gesells. **26a**:125–132. 1908.

PRIMARY PROCESSES	SECONDARY PROCESSES
Anaerobic enzymes (zymase, etc.)	Oxygen of the air
↓	↓
Catalase, reductase	Respiratory oxidases
↓	↓
Products of fermentation (alcohol and other substances)	Phytohematins
	↓
	Products of respiration (CO_2, H_2O)

To unify the respiration of animals and plants still further, it will be necessary to show that the oxygen from the air is not combined directly with the hemochromogen, but by the aid of oxidases; and this the recent discovery of these enzymes in the blood renders probable. The behavior of the colorless blood of the lower animals and the sap of plants is quite similar, according to this view.

It is not to be supposed, however, that oxygen does not have other relations than to the chromogens; but these are neglected in the above scheme, which may be taken as only a partial representation of respiratory processes. In fact the more the matter is studied, the more complex and diversified appear the chemical changes subsumed by the word respiration.—C. R. B.

Fungi and hemicelluloses.—In the hope of obtaining some insight into the action of fungi on their hosts, SCHELLENBERG[5] has investigated the behavior of a number of species, which can be cultivated on media of known composition, in respect to their decomposition of hemicelluloses. Those used were several, the products of whose hydrolysis was known. *Molinia coerulea* among the grasses, *Lupinus hirsutus* among the Leguminosae, *Phoenix dactylifera* among palms, *Impatiens Balsamina* and *Cyclamen europaeum* with an amyloid reserve, and *Ruscus aculeatus* among the lilies furnished the hemicelluloses. On hydrolysis they yield respectively dextrose and xylose, galactose and arabinose, galactose and mannose, galactose and xylose, mannose and a little arabinose. A large number of fungi were tested. To explain their action, which he finds strictly specialized and very different from that on true celluloses, SCHELLENBERG has to assume the existence of at least four different enzymes, which he calls the Molinia, the Lupinus, the date, and the amyloid enzymes. Study of their behavior on dead and living plant parts permits similar conclusions. Thus fungi may be used to eliminate hemicelluloses from celluloses in unlignified tissues. The effect of fungi in the destruction of the plant constituents in the soil is probably much more important than has been believed hitherto.—C. R. B.

Jurassic plants.—SEWARD[6] has published the results of his study of collections of Jurassic plants from Caucasia and Turkestan, sent by the Comité Géologique de Russie. The Caucasian collection contains representatives of the

[5] SCHELLENBERG, H. C., Untersuchungen über das Verhalten einiger Pilze gegen Hemizellulosen. Flora **98**:257–308. 1908.

[6] SEWARD, A. C., Jurassic plants from Caucasia and Turkestan. Mém. Comité Géol. Russie N. S. **38**:1–48. *pls. 1–8.* 1907.